

APPENDIX

Useful quantities

Quantity	Symbol	Value ^a
<i>Physical constants</i>		
speed of light in a vacuum	c	$3.00 \times 10^8 \text{ m s}^{-1}$
Planck constant	h	$6.63 \times 10^{-34} \text{ J s}$
Boltzmann constant	k	$1.38 \times 10^{-23} \text{ J K}^{-1}$
gravitational constant	G	$6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
Stefan–Boltzmann constant	σ	$5.67 \times 10^{-8} \text{ W m}^{-2} \text{ K}^{-4}$
charge of electron	$-e$	$-1.60 \times 10^{-19} \text{ C}$
mass of hydrogen atom	m_{H}	$1.67 \times 10^{-27} \text{ kg}$
mass of electron	m_{e}	$9.11 \times 10^{-31} \text{ kg}$
<i>Astronomical data</i>		
mass of the Earth	M_{E}	$5.98 \times 10^{24} \text{ kg}$
radius (equatorial) of the Earth	R_{E}	$6.38 \times 10^6 \text{ m}$
mass of the Sun	M_{\odot}	$1.99 \times 10^{30} \text{ kg}$
radius of the Sun	R_{\odot}	$6.96 \times 10^8 \text{ m}$
luminosity of the Sun	L_{\odot}	$3.84 \times 10^{26} \text{ W}$
Hubble constant ^b	H_0	$72 \pm 8 \text{ km s}^{-1} \text{ Mpc}^{-1}$

^aValues are given to 3 significant figures. Many of these are known more accurately.

^bFreedman, W. L. *et al. Astrophysical Journal*, **533**, 47–72, (2001).

Units

Quantity	SI Unit	Other units	In SI	Alternative SI units
length	metre, m	Astronomical unit, AU	$1.50 \times 10^{11} \text{ m}$	
		parsec, pc	$3.09 \times 10^{16} \text{ m}$	
time	second, s	year, yr	$3.16 \times 10^7 \text{ s}$	
frequency	hertz, Hz			s^{-1}
force	newton, N			kg m s^{-2}
pressure	pascal, Pa			$\text{kg m}^{-1} \text{ s}^{-2}, \text{ N m}^{-2}$
temperature	kelvin, K	°C	(kelvin – 273)	
energy	joule, J	electronvolt, eV	$1.60 \times 10^{-19} \text{ J}$	$\text{kg m}^2 \text{ s}^{-2}$
power	watt, W			$\text{kg m}^2 \text{ s}^{-3}, \text{ J s}^{-1}$
angle	radian, rad	degree, °	$1/57.3 \text{ rad}$	
		$1^\circ = 60 \text{ arcmin} = 3600 \text{ arcsec}$		
		arcsec, ''	$1/206265 \text{ rad}$	